

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
20 January 2005 (20.01.2005)

PCT

(10) International Publication Number  
**WO 2005/005493 A1**

(51) International Patent Classification: C08F 10/00,  
10/02, C08L 23/08, C08F 10/00, 10/02

(21) International Application Number: PCT/EP2004/051368

(22) International Filing Date: 6 July 2004 (06.07.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data: 03102058.9 9 July 2003 (09.07.2003) EP

(71) Applicant (for all designated States except US): TOTAL  
PETROCHEMICALS RESEARCH FELUY (BE/BE);  
Zone Industrielle C, B-7181 Seneffe (Feluy) (BE).

(72) Inventor; and

(75) Inventor/Applicant (for US only): RAZAVI, Abbas  
[IR/BE]; 35, Domaine de la Brisée, B-7000 Mons (BE).

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, GR, GU, HT, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,  
MG, MK, MN, MW, MX, MY, NA, NI, NO, NZ, OM, PG,  
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,  
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,  
ZW.

(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,  
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,  
FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,  
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.

(54) Title: PROCESS TO PRODUCE BIMODAL POLYOLEFIN WITH METALLOCENE CATALYSTS USING TWO CONTIN-  
UOUSLY STIRRED TANK REACTORS

(57) Abstract: This invention discloses a process for the preparation of polyolefins having a bi- or multimodal molecular weight distribution comprising the steps of: (i) contacting olefin monomer and a first co-reactant with a catalyst system in a first continuously stirred reactor under first polymerisation conditions to produce a product comprising a first polyolefin having a first molecular weight distribution; and (ii) contacting olefin monomer and a second co-reactant with a catalyst system in a second continuously stirred reactor under second polymerisation conditions to produce a product comprising a second polyolefin having a second molecular weight distribution that is different from the first molecular weight distribution; wherein the first and second continuously stirred reactors are connected in series, and the first and second polyolefins are mixed together, and wherein one of the co-reactants is hydrogen and the other is a comonomer, and wherein each catalyst system comprises (a) a bisindenyl catalyst component; and (b) an activating agent which activates the catalyst component.

WO 2005/005493 A1